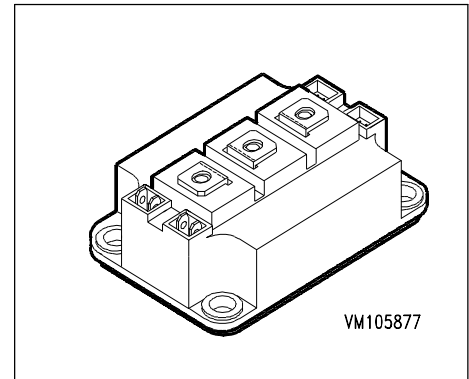


IGBT Power Module

- Single switch with chopper diode at collector
- Including fast free-wheeling diodes
- Package with insulated metal base plate



Type	V_{CE}	I_C	Package	Ordering Code
BSM 100 GAL 120 DN2	1200V	150A	HALF BRIDGE GAL 2	C67076-A2012-A70

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE}	1200	V
Collector-gate voltage	V_{CGR}	1200	
$R_{GE} = 20 \text{ k}\Omega$			
Gate-emitter voltage	V_{GE}	± 20	
DC collector current	I_C	150	A
$T_C = 25 \text{ }^\circ\text{C}$			
$T_C = 80 \text{ }^\circ\text{C}$		100	
Pulsed collector current, $t_p = 1 \text{ ms}$	I_{Cpuls}	300	
$T_C = 25 \text{ }^\circ\text{C}$			
$T_C = 80 \text{ }^\circ\text{C}$		200	
Power dissipation per IGBT	P_{tot}	800	W
$T_C = 25 \text{ }^\circ\text{C}$			
Chip temperature	T_j	+ 150	$^\circ\text{C}$
Storage temperature	T_{stg}	-40 ... + 125	
Thermal resistance, chip case	R_{thJC}	≤ 0.16	K/W
Diode thermal resistance, chip case	R_{thJCD}	≤ 0.3	
Diode thermal resistance, chip-case,chopper	R_{thJCDC}	≤ 0.25	
Insulation test voltage, $t = 1\text{min.}$	V_{is}	2500	Vac
Creepage distance	-	20	mm
Clearance	-	11	
DIN humidity category, DIN 40 040	-	F	sec
IEC climatic category, DIN IEC 68-1	-	40 / 125 / 56	

Electrical Characteristics, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static Characteristics

Gate threshold voltage $V_{GE} = V_{CE}, I_C = 4\text{ mA}$	$V_{GE(th)}$	4.5	5.5	6.5	V
Collector-emitter saturation voltage $V_{GE} = 15\text{ V}, I_C = 100\text{ A}, T_j = 25\text{ °C}$ $V_{GE} = 15\text{ V}, I_C = 100\text{ A}, T_j = 125\text{ °C}$	$V_{CE(sat)}$	- -	2.5 3.1	3 3.7	
Zero gate voltage collector current $V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_j = 25\text{ °C}$ $V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_j = 125\text{ °C}$	I_{CES}	- -	1.5 6	2 -	mA
Gate-emitter leakage current $V_{GE} = 20\text{ V}, V_{CE} = 0\text{ V}$	I_{GES}	-	-	400	

AC Characteristics

Transconductance $V_{CE} = 20\text{ V}, I_C = 100\text{ A}$	g_{fs}	54	-	-	S
Input capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	C_{iss}	-	6.5	-	nF
Output capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	C_{oss}	-	1	-	
Reverse transfer capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	C_{rss}	-	0.5	-	

Electrical Characteristics, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Switching Characteristics, Inductive Load at $T_j = 125\text{ °C}$

Turn-on delay time $V_{CC} = 600\text{ V}$, $V_{GE} = 15\text{ V}$, $I_C = 100\text{ A}$ $R_{Gon} = 6.8\text{ }\Omega$	$t_{d(on)}$	-	130	260	ns
Rise time $V_{CC} = 600\text{ V}$, $V_{GE} = 15\text{ V}$, $I_C = 100\text{ A}$ $R_{Gon} = 6.8\text{ }\Omega$	t_r	-	80	160	
Turn-off delay time $V_{CC} = 600\text{ V}$, $V_{GE} = -15\text{ V}$, $I_C = 100\text{ A}$ $R_{Goff} = 6.8\text{ }\Omega$	$t_{d(off)}$	-	400	600	
Fall time $V_{CC} = 600\text{ V}$, $V_{GE} = -15\text{ V}$, $I_C = 100\text{ A}$ $R_{Goff} = 6.8\text{ }\Omega$	t_f	-	70	100	

Free-Wheel Diode

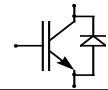
Diode forward voltage $I_F = 100\text{ A}$, $V_{GE} = 0\text{ V}$, $T_j = 25\text{ °C}$ $I_F = 100\text{ A}$, $V_{GE} = 0\text{ V}$, $T_j = 125\text{ °C}$	V_F	-	2 1.8	2.5 -	V
Reverse recovery time $I_F = 100\text{ A}$, $V_R = -600\text{ V}$, $V_{GE} = 0\text{ V}$ $di_F/dt = -1000\text{ A}/\mu\text{s}$, $T_j = 125\text{ °C}$	t_{rr}	-	0.3	-	
Reverse recovery charge $I_F = 100\text{ A}$, $V_R = -600\text{ V}$, $V_{GE} = 0\text{ V}$ $di_F/dt = -1000\text{ A}/\mu\text{s}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	Q_{rr}	-	4 14	- -	μC
		-			

Electrical Characteristics, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Chopper Diode

Chopper diode forward voltage $I_{FC} = 150\text{ A}$, $V_{GE} = 0\text{ V}$, $T_j = 25\text{ °C}$ $I_{FC} = 150\text{ A}$, $V_{GE} = 0\text{ V}$, $T_j = 125\text{ °C}$	V_{FC}	- -	2 1.8	2.5 -	V
Reverse recovery time, chopper $I_{FC} = 150\text{ A}$, $V_R = -600\text{ V}$, $V_{GE} = 0\text{ V}$ $di_F/dt = -1500\text{ A}/\mu\text{s}$, $T_j = 125\text{ °C}$	t_{rrC}	-	0.4	-	μs
Reverse recovery charge, chopper $I_{FC} = 150\text{ A}$, $V_R = -600\text{ V}$, $V_{GE} = 0\text{ V}$ $di_F/dt = -1500\text{ A}/\mu\text{s}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	Q_{rrC}	- -	5 18	- -	μC



The technical drawing consists of two views of the GAR-6000 connector:

- Side View (Top):** Shows the profile of the connector. Key dimensions include a total height of 30.5 mm, a base thickness of 5 mm, a main body height of 26 mm, and a mounting flange height of 7 mm. A central M6 screw hole is shown with a diameter of 2.8 mm and a depth of 0.5 mm. The overall width is 106.4 mm.
- Top View (Bottom):** Shows the layout of the three contact positions (1, 2, 3) and the four mounting holes (4, 5, 6, 7). Dimensions include a total width of 106.4 mm, a distance of 93 mm between the centers of the first and last contacts, and individual contact widths of 28 mm each. Mounting hole diameters are specified as Ø6.4 mm. Pin locations are defined by distances of 22.5 mm, 22 mm, and 22.5 mm from the edges. Vertical dimensions show a total width of 61.4 mm, with specific offsets of 14 mm, 15 mm, 27 mm, and 48 mm for the various features.

The circuit diagram shows a 74148 3-to-8 decoder with inputs 1, 2, and 3. The decoder's output 6 is connected to input 1 of a 7400 NAND gate. The decoder's output 7 is connected to input 2 of the same NAND gate. The output of the NAND gate is labeled 3. The decoder's output 3 is also connected to output 6 of the NAND gate. The decoder's output 4 is connected to output 7 of the NAND gate. The decoder's output 5 is connected to output 3 of the NAND gate. The decoder's output 2 is connected to output 4 of the NAND gate. The decoder's output 1 is connected to output 5 of the NAND gate. The decoder's output 0 is connected to output 6 of the NAND gate. The decoder's output 7 is connected to output 7 of the NAND gate. The decoder's output 6 is connected to output 3 of the NAND gate. The decoder's output 5 is connected to output 4 of the NAND gate. The decoder's output 4 is connected to output 5 of the NAND gate. The decoder's output 3 is connected to output 6 of the NAND gate. The decoder's output 2 is connected to output 7 of the NAND gate. The decoder's output 1 is connected to output 3 of the NAND gate. The decoder's output 0 is connected to output 4 of the NAND gate.

GAR type

1

2

3

4